

AN EVALUATION OF FUYO-1(JERS-1) OPTICAL DATA  
FOR-GEOLOGIC INTERPRETATION\*

Robert E. Crippen  
John P. Ford  
Ronald G. Blom

Jet Propulsion laboratory MS 300-233  
California Institute of Technology  
Pasadena, California 91109 USA

Roy K. Dokka

Department of Geology and Geophysics  
Louisiana State University  
Baton Rouge, Louisiana 70803 USA

SUMMARY

An image of the Fort Irwin area in the Mojave Desert taken by Fuyo-1, Japan's Earth Resources Satellite (JERS), has been processed and compared to a Landsat Thematic Mapper (TM) image of the same area. Fuyo-1 was designed, in part, to provide greater spectral resolution than TM in the shortwave infrared (SWIR) spectral region and greater spatial resolution in all bands, at 20m versus 30m. It also provides monochrome, along-track stereoscopic coverage in the near-infrared. Otherwise it is very similar to TM, although it does not include TM's visible blue band.

Preliminary results of our evaluation and comparison indicate that despite numerous problems in data quality, image processing methods can be used to produce clean and informative spectral maps from the Fuyo data that are similar to those that can be generated from TM. However, extraction of the additional information potentially provided by the SWIR bands is difficult because those bands suffer from the worst data problems (along-track blurring). Also, all bands do not appear spatially sharp, raising doubts on the spatial superiority of the Fuyo data, and the data are generally radiometrically poor, leading to the appearance of quantization steps in some bands. Our processing methods to produce clean and informative images used band selection, noise reduction, sharpening, and appropriate chromatic enhancement to overcome the data problems.

Our preliminary conclusion is that Fuyo data can be used in the same manner that we use TM data for lithologic differentiation and structural interpretation, although with some difficulty. Additionally, the availability of same-pass stereoscopic coverage will be very useful for some studies.

\*Presented at the Tenth Thematic Conference on Geologic Remote Sensing,  
San Antonio, Texas, 9-12 May 1994.